

Docket No. PORT-012

## APPLICATION

**FOR UNITED STATES LETTERS PATENT**

## SPECIFICATION

18 TO ALL WHOM IT MAY CONCERN:

19

20 BE IT KNOWN THAT I, **Timothy R. Wilson**, a citizen of the United States,  
21 have invented a new and useful railroad e-clip removal system of which the following  
22 is a specification:

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3                   **Railroad E-Clip Removal System**

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6                   **CROSS REFERENCE TO RELATED APPLICATIONS**

7       Not applicable to this application.

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10                  **STATEMENT REGARDING FEDERALLY**

11                  **SPONSORED RESEARCH OR DEVELOPMENT**

12       Not applicable to this application.

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15                  **BACKGROUND OF THE INVENTION**

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19       **Field of the Invention**

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21       The present invention relates generally to railroad e-clip removing devices and

22       more specifically it relates to a railroad e-clip removal system for efficiently and safely

23       removing railroad e-clips from a railroad track.

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26       **Description of the Related Art**

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28       Railroad clip members, such as e-clips, have been in use for years.

29       Conventional e-clips are slidably positioned within a tubular support member attached

1 to a rail pad as shown in Figure 1 of the drawings. E-clips are comprised of a resilient  
2 metal that grip the rail under vibrating conditions without damage. Conventional  
3 methods of removing e-clips are typically comprised of utilizing a hammer to drive the  
4 e-clips from the tubular support member or elongate bar members utilized to pry the e-  
5 clips from the tubular support member.

6

7       Conventional methods and tools for removing e-clips from a railroad track are  
8 cumbersome. In addition, these methods and tools are not safe to remove e-clips  
9 which are under significant stress and forces when securing a rail member thereby  
10 causing them to "shoot outwardly" after being released from the tubular support  
11 member. Also, it is time consuming to manually remove e-clips from the tubular  
12 support member.

13

14       While these devices may be suitable for the particular purpose to which they  
15 address, they are not as suitable for efficiently and safely removing railroad e-clips  
16 from a railroad track. Conventional methods and tools for removing e-clips from  
17 railroad tracks are difficult to utilize and inherently dangerous to the worker.

18

19       In these respects, the railroad e-clip removal system according to the present  
20 invention substantially departs from the conventional concepts and designs of the prior  
21 art, and in so doing provides an apparatus primarily developed for the purpose of  
22 efficiently and safely removing railroad e-clips from a railroad track.

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2                   **BRIEF SUMMARY OF THE INVENTION**

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4         In view of the foregoing disadvantages inherent in the known types of e-clip  
5         removal devices now present in the prior art, the present invention provides a new  
6         railroad e-clip removal system construction wherein the same can be utilized for  
7         efficiently and safely removing railroad e-clips from a railroad track.

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9         The general purpose of the present invention, which will be described  
10      subsequently in greater detail, is to provide a new railroad e-clip removal system that  
11      has many of the advantages of the railroad clip removal devices mentioned heretofore  
12      and many novel features that result in a new railroad e-clip removal system which is  
13      not anticipated, rendered obvious, suggested, or even implied by any of the prior art  
14      railroad clip removal system, either alone or in any combination thereof.

15

16         To attain this, the present invention generally comprises an outer tube with an  
17      outer cutout, an inner tube slidably positioned within a lumen of the outer tube, an  
18      inner cutout within the inner tube having an engaging portion, and an actuator unit  
19      attached to the tubes for extending/retracting the inner tube within the outer tube. The  
20      engaging portion of the inert tube engages a portion of an e-clip when the actuator unit  
21      is extended thereby forcing the e-clip from a tubular support member attached to a rail  
22      pad. The e-clip is thereby safely and efficiently removed from the railroad track.

23

24         There has thus been outlined, rather broadly, the more important features of the  
25      invention in order that the detailed description thereof may be better understood, and  
26      in order that the present contribution to the art may be better appreciated. There are  
27      additional features of the invention that will be described hereinafter and that will form  
28      the subject matter of the claims appended hereto.

1        In this respect, before explaining at least one embodiment of the invention in  
2 detail, it is to be understood that the invention is not limited in its application to the  
3 details of construction and to the arrangements of the components set forth in the  
4 following description or illustrated in the drawings. The invention is capable of other  
5 embodiments and of being practiced and carried out in various ways. Also, it is to be  
6 understood that the phraseology and terminology employed herein are for the purpose  
7 of the description and should not be regarded as limiting.

8

9        A primary object of the present invention is to provide a railroad e-clip removal  
10 system that will overcome the shortcomings of the prior art devices.

11

12        A second object is to provide a railroad e-clip removal system for efficiently  
13 and safely removing railroad e-clips from a railroad track.

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15        Another object is to provide a railroad e-clip removal system that does not  
16 allow the e-clip to accidentally hit a worker.

17

18        An additional object is to provide a railroad e-clip removal system that  
19 significantly reduces the amount of manual labor required to remove an e-clip.

20

21        Other objects and advantages of the present invention will become obvious to the  
22 reader and it is intended that these objects and advantages are within the scope of the  
23 present invention.

24

25        To the accomplishment of the above and related objects, this invention may be  
26 embodied in the form illustrated in the accompanying drawings, attention being called  
27 to the fact, however, that the drawings are illustrative only, and that changes may be  
28 made in the specific construction illustrated and described within the scope of the  
29 appended claims.

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2                   **BRIEF DESCRIPTION OF THE DRAWINGS**

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4         Various other objects, features and attendant advantages of the present  
5 invention will become fully appreciated as the same becomes better understood when  
6 considered in conjunction with the accompanying drawings, in which like reference  
7 characters designate the same or similar parts throughout the several views, and  
8 wherein:

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10         FIG. 1 is an upper perspective view of an e-clip attached to a tubular support  
11 member for retaining a rail member of a railroad track.

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13         FIG. 2 is an upper perspective view of the present invention.

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15         FIG. 3 is a lower perspective view of the present invention.

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17         FIG. 4 is a side view of the present invention with the inner tube retracted.

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19         FIG. 5 is a side view of the present invention with the inner tube extended.

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21         FIG. 6 is a cross sectional view taken along line 6-6 of Figure 5.

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23         FIG. 7 is a cross sectional view taken along line 7-7 of Figure 5.

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25         FIG. 8 is a bottom view of the present invention with the inner tube retracted.

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27         FIG. 9 is a bottom view of the present invention with the inner tube extended.

1           FIG. 10 is an upper perspective view of the present invention positioned about  
2 an e-clip to be removed.

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4           FIG. 11 is a side view of the present invention positioned about an e-clip to be  
5 removed.

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## 2 DETAILED DESCRIPTION OF THE INVENTION

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### 4 A. Overview

5       Turning now descriptively to the drawings, in which similar reference  
6 characters denote similar elements throughout the several views, FIGS. 1 through 11  
7 illustrate a railroad e-clip removal system **10**, which comprises an outer tube **20** with  
8 an outer cutout **26**, an inner tube **30** slidably positioned within a lumen **24** of the outer  
9 tube **20**, an inner cutout **34** within the inner tube **30** having an engaging portion **32**,  
10 and an actuator unit **40** attached to the tubes for extending/retracting the inner tube **30**  
11 within the outer tube **20**. The engaging portion **32** of the inert tube engages a portion  
12 of an e-clip **18** when the actuator unit **40** is extended thereby forcing the e-clip **18** from  
13 a tubular support member **16** attached to a rail pad **14**. The e-clip **18** is thereby safely  
14 and efficiently removed from the railroad track.

15

### 16 B. Outer Tube

17       The outer tube **20** has an elongate structure with an outer cutout **26** as best  
18 shown in Figure 3 of the drawings. The outer tube **20** may have various cross sectional  
19 shapes such as rectangular, square, oval, circular and the like.

20

21       The outer tube **20** has an inner lumen **24** that slidably receives the inner tube **30**  
22 as shown in Figures 2 and 3 of the drawings. As shown in Figure 4 of the drawings,  
23 the outer tube **20** is preferably longer in length than the inner tube **30**. The outer tube  
24 **20** provides support and stability to the inner tube **30** when the engaging portion **32** of  
25 the inner tube **30** is engaging the e-clip **18**.

26

27       As shown in Figures 2 through 5 of the drawings, a plurality of legs **22** are  
28 attached to the outer tube **20**. The legs **22** are preferably on the outside portions of the  
29 outer tube **20** for providing support and stability to the outer tube **20** during usage.

1 One of the legs **22** is preferably engageable to a tubular support member **16** during  
2 removal of an e-clip **18** (i.e. the leg that is positioned between the tubular support  
3 member **16** and the rail member **12**). In addition, one of the legs **22** is preferably  
4 shorter than the other legs **22** and has a flanged portion for being positioned upon a rail  
5 foot of a rail member **12** as shown in Figures 3 and 5 of the drawings.

6

7 **C. Support Structure**

8 As shown in Figures 4, 5, **10** and 11 of the drawings, a support structure **50**  
9 having is attached to the outer tube **20** for allowing the user to manipulate the present  
10 invention. The support structure **50** preferably includes a handle member **52** attached  
11 to the outer tube **20** as further shown in Figures 4, 5, **10** and 11. The support structure  
12 **50** may be comprised of various structures other than shown in the figures.

13

14 **D. Inner Tube**

15 The inner tube **30** is slidably positioned within the lumen **24** of the outer tube  
16 **20** as shown in Figures 3 through 5 of the drawings. The outer tube **20** and the outer  
17 tube **20** preferably have a similar cross sectional shape, however the tubes **20**, **30** may  
18 have differing cross section shapes.

19

20 The inner tube **30** includes an inner cutout **34** and an engaging portion **32** as  
21 further shown in Figure 3 of the drawings. The outer cutout **26** and the inner cutout **34**  
22 are preferably similar in position and size. The engaging portion **32** is engageable to  
23 an e-clip **18** for forcing the e-clip **18** from the tubular support member **16** as shown in  
24 Figure 11 of the drawings.

25

26 The engaging portion **32** is comprised of a lower rear edge of the inner cutout  
27 **34** as best illustrated in Figures 3, 8 and 9 of the drawings. The engaging portion **32** is  
28 positioned near a rear portion of the outer cutout **26** when the inner tube **30** is retracted  
29 as shown in Figure 4 of the drawings. The engaging portion **32** also preferably extends

1 below the outer cutout **26** for engaging the e-clip **18** as best shown in Figure 5 of the  
2 drawings.

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4 **E. Actuator Unit**

5 The actuator unit **40** is attached to the outer tube **20** and includes an  
6 extendable/retractable shaft member **42** as shown in Figures 3 through 9 of the  
7 drawings. The actuator unit **40** may be comprised of any type of conventional actuator  
8 such as but not limited to electrical actuator, hydraulic cylinder and the like. A control  
9 switch is preferably attached to the support structure **50** for allowing the user to control  
10 the actuator unit **40**. If a hydraulic cylinder is utilized for the actuator unit **40**, a  
11 hydraulic fluid source is needed to operate the present invention.

12

13 The shaft member **42** is attached to the rear end of the inner tube **30** as shown  
14 in Figures 6 and 7 of the drawings. The actuator unit **40** extends/retracts the inner tube  
15 **30** with respect to the outer tube **20** thereby allowing the engaging portion **32** to  
16 engage the e-clip **18** during usage.

17

18 **F. Operation of Invention**

19 In use, the user positions the present invention over the e-clip **18** to be removed  
20 as shown in Figure 10 of the drawings. After the present invention is properly  
21 positioned, the actuator unit **40** is thereafter extended thereby causing the engaging  
22 portion **32** to engage the upper exposed portion of the e-clip **18** as shown in Figure 11  
23 of the drawings. The engaging portion **32** continues to force the e-clip **18** outwardly  
24 from the tubular support member **16** of the rail pad **14** as the toe portion of the e-clip  
25 **18** slides along the rail foot of the rail member **12**. The actuator continues extending  
26 until the e-clip **18** is fully removed from the tubular support member **16**. The user then  
27 simply lifts the present invention from the work area and is able to retrieve the  
28 removed e-clip **18**.

29

1        As to a further discussion of the manner of usage and operation of the present  
2 invention, the same should be apparent from the above description. Accordingly, no  
3 further discussion relating to the manner of usage and operation will be provided.  
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5        With respect to the above description then, it is to be realized that the optimum  
6 dimensional relationships for the parts of the invention, to include variations in size,  
7 materials, shape, form, function and manner of operation, assembly and use, are  
8 deemed to be within the expertise of those skilled in the art, and all equivalent  
9 structural variations and relationships to those illustrated in the drawings and  
10 described in the specification are intended to be encompassed by the present invention.

11  
12       Therefore, the foregoing is considered as illustrative only of the principles of  
13 the invention. Further, since numerous modifications and changes will readily occur to  
14 those skilled in the art, it is not desired to limit the invention to the exact construction  
15 and operation shown and described, and accordingly, all suitable modifications and  
16 equivalents may be resorted to, falling within the scope of the invention.